

U.S. Patent Application Serial No. 10/076,485
Amendment dated December 9, 2003
Reply to OA of September 10, 2003

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): In a terminal structure of a storage battery, wherein a plate terminal whose one end plate portion is connected to an electrode pole of the storage battery, and whose led-out plate portion led out from the electrode pole to a notch formed in a cover of the storage battery is formed into an L-shaped led-out plate portion vertically bent downwards and is provided with a bolt insertion hole, is mounted on a cover face, the improvement being that a lower plate portion of the vertical plate portion of said plate terminal is provided with an engagement portion, and said lower plate portion of said plate terminal is pressed into a [[snug]] fit hole provided in said cover face, so as to fix said engagement portion in engagement with an opposing face of said [[snug]] fit hole, wherein the engagement portion are teeth at both side edges of the lower plate portion of the vertical plate portion.

Claim 2 (original): The terminal structure of the storage battery according to claim 1, wherein said engagement portion is formed of at least one member selected from the group consisting of a convex part, a concave part and a through hole in a desired shape.

U.S. Patent Application Serial No. 10/076,485
Amendment dated December 9, 2003
Reply to OA of September 10, 2003

Claim 3 (currently Amended): ~~In a terminal structure of the storage battery according to claim 1 or 2~~

In a terminal structure of a storage battery, wherein a plate terminal whose one end plate portion is connected to an electrode pole of the storage battery, and whose led-out plate portion led out from the electrode pole to a notch formed in a cover of the storage battery is formed into an L-shaped led-out plate portion vertically bent downwards and is provided with a bolt insertion hole, is mounted on a cover face, the improvement being that a lower plate portion of the vertical plate portion of said plate terminal is provided with an engagement portion, and said lower plate portion of said plate terminal is pressed into a fit hole provided in said cover face, so as to fix said engagement portion in engagement with an opposing face of said fit hole, wherein the plate terminal is so formed as to be provided with bolt insertion holes which are respectively provided in the horizontal plate portion and the vertical plate portion of the led-out plate portion and with nut accommodation spaces which are respectively defined on backsides of the horizontal plate portion and the vertical plate portion and is mounted on a bottom face of the notch of the cover, the improvement being that teeth are formed as the engagement portion at both side edges of a lower plate portion of said vertical plate portion, and said lower plate portion of said plate terminal is pressed into a [[snug]] fit hole provided in the bottom face of said notch, so as to fix said teeth at both the side edges in engagement with respectively opposing wall faces of said [[snug]] fit hole.

Claim 4 (currently Amended): In the terminal structure of the storage battery according

U.S. Patent Application Serial No. 10/076,485
Amendment dated December 9, 2003
Reply to OA of September 10, 2003

to claim 3, the improvement being that right and left bent plate portions are disposed which are bent in an L-shape rearwards from both sides of a lower plate portion of said vertical plate portion, teeth being provided as the engagement portion at rear end edges of said right and left bent plate portions, while rear right and left bent plate portions are disposed which are bent in an L-shape frontwards from both sides of a lower plate portion of a rear vertical plate portion that is formed behind and in opposition to the first-mentioned vertical plate portion by vertically bending a rear part of said horizontal plate portion downwards, teeth being provided as the engagement portion at front end edges of said rear right and left bent plate portions, and that said right and left bent plate portions of the front vertical plate portion and said rear right and left bent plate portions of said rear vertical plate portion are respectively pressed into front right and left [[snug]] fit holes and rear right and left [[snug]] fit holes provided in said bottom face of said notch of said cover, so as to fix the front right and left teeth and the rear right and left teeth in engagement with opposing inner wall faces of the respectively corresponding [[snug]] fit holes.

Claim 5 (original): The terminal structure of the storage battery according to claim 3 or 4, wherein a nut receiver and turning stopper plate portion is formed under the bolt insertion hole of said front vertical plate portion of said plate terminal by bending part of said front vertical plate portion inwards.

U.S. Patent Application Serial No. 10/076,485
Amendment dated December 9, 2003
Reply to OA of September 10, 2003

Claim 6 (currently Amended): In the terminal structure of the storage battery according to claim 3, the improvement being that an engagement-fixing face is provided as the engagement portion on at least one of front and back faces of a lower plate portion of said vertical plate portion, said engagement-fixing face including a plurality of engagement-fixing protuberances, and that said lower plate portion of said plate terminal is pressed into a [[snug]] fit hole provided in the bottom face of said notch, so as to fix said engagement-fixing protuberances of said engagement-fixing face in engagement with an opposing wall face of said [[snug]] fit hole.

Claim 7 (currently Amended): The terminal structure of the storage battery according to claim 6, wherein teeth are provided at both side edges of said lower plate portion of said vertical plate portion, and they are fixed in engagement with opposing wall faces of said [[snug]] fit hole.

Claim 8 (currently Amended): In the terminal structure of the storage battery according to claim 3, the improvement being that a lower plate portion of said vertical plate portion of said plate terminal is formed as the engagement portion with an engagement-stopping plate portion by bending inwards a free piece which is formed from cutting in said lower plate portion, and that said lower plate portion of said plate terminal is pressed into a [[snug]] fit hole provided in the bottom face of said notch of said cover, so as to fix said engagement-fixing plate portion in engagement with an opposing wall face of said [[snug]] fit hole.

U.S. Patent Application Serial No. 10/076,485
Amendment dated December 9, 2003
Reply to OA of September 10, 2003

Claim 9 (original): The terminal structure of the storage battery according to claim 8, wherein at least one of front and back faces of said lower portion of said vertical plate portion is formed into an engagement-fixing face which includes engagement-fixing protuberances as an engagement portion, and which is located below said engagement-stopping plate portion.

Claim 10 (original): The terminal structure of the storage battery according to either of claims 8 and 9, wherein teeth are further provided as the engagement portion at both side edges of said lower plate portion of said vertical plate portion.

Claim 11 (original): The terminal structure of the storage battery according to any of claims 8 through 10, wherein the cutting is made in an H-shape in said lower plate portion under the bolt insertion hole provided in said vertical plate portion of said plate terminal, and the lower free piece is bent inwards into said engagement-fixing plate portion, while an upper free piece is bent inwards into a nut receiver and turning stopper horizontal plate portion.

Claim 12 (original): The terminal structure of the storage battery according to any of claims 1 through 11, wherein said plate terminal includes threaded cylinders which are unitarily provided

U.S. Patent Application Serial No. 10/076,485
Amendment dated December 9, 2003
Reply to OA of September 10, 2003

in the back faces of said horizontal plate portion and said vertical plate portion at positions registering with the corresponding bolt insertion holes, respectively.

Claim 13 (currently Amended): The terminal structure of the storage battery according to any of claims 1 through 12, wherein a free plate portion is formed between ~~right and left~~ two cuts which are provided at opposite ends of a lower end of said lower plate portion of said plate terminal, and a rectangular horizontal plate portion is provided as an engagement portion by bending said free plate portion inwards at a right angle.

Claim 14 (currently Amended): In the terminal structure of the storage battery according to any of claims 1 through 13, the improvement being that said bolt insertion hole is provided in a horizontal plate portion of said L-shaped led-out plate portion, that said lower plate portion is provided with the engagement portion of desired shape, that said bolt insertion hole of said plate terminal is ~~snugly~~ fitted on a stud bolt which is set upright on a bottom face of said notch of said cover, and that said lower plate portion is pressed into a [[snug]] fit hole provided in said cover, so as to fix said engagement portions in engagement with opposing wall faces of said [[snug]] fit hole.

Claim 15 (currently Amended): The terminal structure of the storage battery according to claim 14, wherein at least one lower plate portion is provided at an intermediate part of said

U.S. Patent Application Serial No. 10/076,485
Amendment dated December 9, 2003
Reply to OA of September 10, 2003

horizontal plate portion, while a [[snug]] fit hole corresponding to said lower plate portion of the intermediate part is provided in the bottom face of said notch of said cover, and that the intermediate lower plate portion is pressed into the corresponding [[snug]] fit hole so as to fix engagement portions provided in said intermediate lower plate portion, in engagement with opposing wall faces of said corresponding [[snug]] fit hole.

Claim 16 (currently Amended): ~~The terminal structure of the storage battery according to any of claims 1 through 15~~

In a terminal structure of a storage battery, wherein a plate terminal whose one end plate portion is connected to an electrode pole of the storage battery, and whose led-out plate portion led out from the electrode pole to a notch formed in a cover of the storage battery is formed into an L-shaped led-out plate portion vertically bent downwards and is provided with a bolt insertion hole, is mounted on a cover face, the improvement being that a lower plate portion of the vertical plate portion of said plate terminal is provided with an engagement portion, and said lower plate portion of said plate terminal is pressed into a fit hole provided in said cover face, so as to fix said engagement portion in engagement with an opposing face of said fit hole, wherein said plate terminal has said lower plate portion pressed into said [[snug]] fit hole while being irradiated with ultrasonic waves simultaneously with application of a mechanical pressure to said plate terminal.

U.S. Patent Application Serial No. 10/076,485
Amendment dated December 9, 2003
Reply to OA of September 10, 2003

Claim 17 (original): The terminal structure of the storage battery according to claim 16, wherein the irradiation with the ultrasonic waves is stopped when, in pressedly inserting said plate terminal, a pressure load has been suddenly increased by abutment of said plate terminal on said cover.

Claim 18 (original): The terminal structure of the storage battery according to claim 16, wherein the irradiation with the ultrasonic waves is continued for a short time after, in pressedly inserting said plate terminal, a pressure load has been suddenly increased by abutment of said plate terminal on said cover.

Claim 19 (currently Amended): The terminal structure of the storage battery according to any of claims 1 through 17, wherein the faces of said [[snug]] fit hole of said cover and said lower plate portion of said plate terminal pressed into said [[snug]] fit hole are bonded by an adhesive.